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PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JEONGMIN MOON

Appeal 2009-0067
Application 09/589,881
Technology Center 2800

Decided:¹ February 25, 2009

Before TERRY J. OWENS, PETER F. KRATZ, and
JEFFREY B. ROBERTSON, *Administrative Patent Judges*.

ROBERTSON, *Administrative Patent Judge*.

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134(a) (2002) from the Examiner's rejection of claims 1-4, 6-11, 14-21, 23, and 24.² (Examiner's Answer entered August 9, 2005, hereinafter "Ans."). We have jurisdiction pursuant to 35 U.S.C. § 6(b) (2002).

We AFFIRM.³

THE INVENTION

Appellant describes an auxiliary light source device (claims 1, 11, and 21) and a reflective liquid crystal display device (claim 10). Appellant states that the auxiliary light source device has high light utilization efficiency and improved display characteristics. (Spec. 3).

Claims 1 and 10, reproduced below, are representative of the subject matter on appeal.

1. An auxiliary light source device for a reflective liquid crystal display device having a reflector, the auxiliary light source device comprising:

a light source; and

a light directing member for directing incident light from the light source toward the reflector outwardly along an orthogonal direction, the light directing member including,

a lower surface having a plurality of convex portions extending from the lower surface, each of the convex portions

² Claims 5, 12, 13, and 22 have been canceled. (Appeal Brief filed June 1, 2005, hereinafter "App. Br.," 5).

³ Oral arguments were heard on February 10, 2009.

having a substantially planar surface which is substantially parallel to the lower surface, and an angle between the lower surface and a surface connecting the planar surface of the convex portion is about 90° , wherein light reflected along an orthogonal direction to the liquid crystal display device is uniform.

10. A reflective liquid crystal display device, comprising:

a display panel including two substrates spaced apart, liquid crystal sandwiched between the two substrates, and a reflector to reflect light through the liquid crystal;

an auxiliary light source device for supplying light to the display panel, including,

a light source,

a light directing member for directing incident light from the light source toward the display panel, the directing member having a lower surface having a plurality of convex portions, each having a substantially planar surface which is substantially parallel to the lower surface, an angle between the lower surface and a surface connecting the planar surface of the convex portion being about 90° , wherein light reflected along an orthogonal direction to the display panel is uniform; and

a light reflecting member which guides light from the light source into the light directing member, said display panel being between said auxiliary light source and said light reflecting member.

THE REJECTIONS

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

| | | |
|----------|-----------------|-------------------------------|
| Funamoto | EP 0 878 720 A1 | Nov. 18, 1998 |
| Shinji | US 6,259,854 B1 | Jul. 10, 2001 (Jan. 29, 1999) |

The Examiner rejected claims 1-4, 6-9, 11, 14-21, 23, and 24 under 35 U.S.C. § 102(e) as being anticipated by Shinji. The Examiner rejected claim 10 under 35 U.S.C. §102(b) as being anticipated by Funamoto.

The Examiner found that Shinji teaches the auxiliary light source device recited in claim 1. (Ans. 3 and 4). In particular, the Examiner found that as a result of the structure of Shinji's light directing member (lightguide), a light ray can be outwardly directed along an orthogonal direction when it strikes the convex portion of the light directing member at different angles. (Ans. 3-4). The Examiner also found that Shinji teaches that the light reflected along an orthogonal direction to the liquid display device is uniform. (Ans. 4).

The Examiner found that Funamoto teaches the reflective crystal display device of claim 10. (Ans. 7 and 8). In particular, the Examiner found that Funamoto discloses a liquid crystal display panel including a reflector as claimed. (Ans. 8).

Appellant argues that Shinji teaches against the claim recitation that light reflected in the orthogonal direction is uniform. (App. Br. 11). Appellant contends that the Examiner's light rays and angles are not disclosed by Shinji. (App. Br. 11-14; Reply Brief filed October 11, 2005, hereinafter "Rep. Br.," 6). Appellant also argues that Shinji teaches that convex portions having the recited angles of about 90° do not produce the recited uniform light. (Rep. Br. 5). Appellant contends that Funamoto's reflector is separate from the display panel, instead of being part of the display panel as recited in claim 10. (App. Br. 16).

ISSUES

Has Appellant shown that the Examiner erred in finding that Shinji teaches the auxiliary light source device as claimed?

Has Appellant shown that the Examiner erred in finding that Funamoto discloses the reflective liquid crystal display device as recited in claim 10?

We answer these questions in the negative.

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

1. Appellant's Figure 4 is reproduced below:

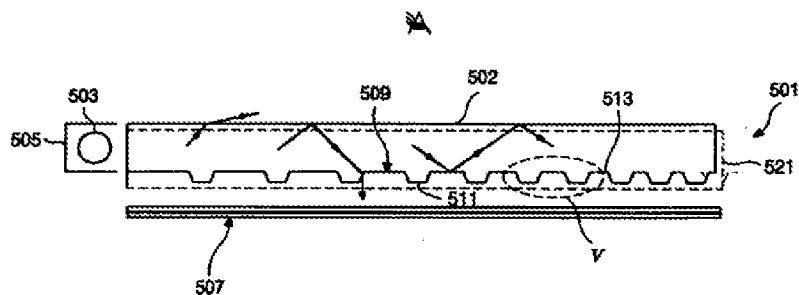


Figure 4 depicts an auxiliary light source device, including a light source 503, a lamp reflector 505, a light directing member 501 having an upper surface 502, a lower surface 509, a wall reflector 521, a plurality of convex portions 511, a surface 513, and a reflector 507. (Spec. 6, ll. 5-27).

2. Appellant's Figure 3 is reproduced below:

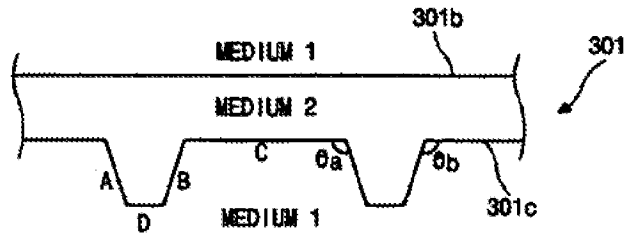


Figure 3 depicts a light directing member 301, including an upper surface 301b, a lower surface 301c, main surface C, surfaces A, B, and D that together define a convex portion, and angles Θ_a and Θ_b , which approach 90° . (Spec. 5, l. 18 – 6, l. 4).

3. Appellant's Specification states:

If the size, shape and position of the pyramid-shaped convex portions . . . are appropriately selected, it is possible to produce a relatively uniform emitting light distribution on the liquid crystal display panel...an arrangement of these convex portions . . . can be varied according to the amount of the emitting light to produce a uniform emitting light distribution.
(Spec. 4, ll. 23-29).

4. Appellant's Specification states:

the closer the angle Θ_a or the angle Θ_b become to 90° , the more perpendicularly the incident light is directed to the liquid crystal display panel. Namely when surface A or the surface B becomes perpendicular to the surface C, the angle Θ_p between the surfaces A and B becomes zero and the emitting light is directed more perpendicularly toward the liquid crystal display panel.
(Spec. 5, ll. 8-14).

5. Appellant's Specification states:

Surfaces A, B and D together define a convex portion oriented toward the lower reflector (not shown). The angles Θ_a and Θ_b between the surfaces A and C, and between the surfaces B and C, respectively, approach 90° , and the surface D is substantially

parallel to the surface C. The convex portion of the lower surface, which can alter the incident angle of reflected light to an angle close to 90°, is relatively easy to manufacture. (Spec. 5, ll. 19-25).

6. Appellant's Specification is silent as to the degree of uniformity necessary to meet the claim recitation that "the light reflected along an orthogonal direction to the liquid crystal display device is uniform."
7. Appellant's Specification is silent as to the arrangement of the reflector in the liquid display panel.
8. Shinji's Figure 1a is reproduced below:

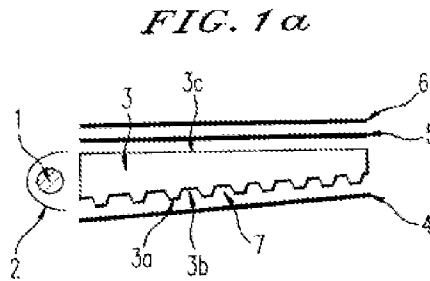


Figure 1a depicts a lightguide 3 having a primary light source 1, protruding trapezoidal patterns 3a, scattering reflection planes 3a and 3b, reflection sheet 4, and air layer 7. (Col. 4, ll. 51-67).

9. Shinji's Figure 4 is reproduced below:

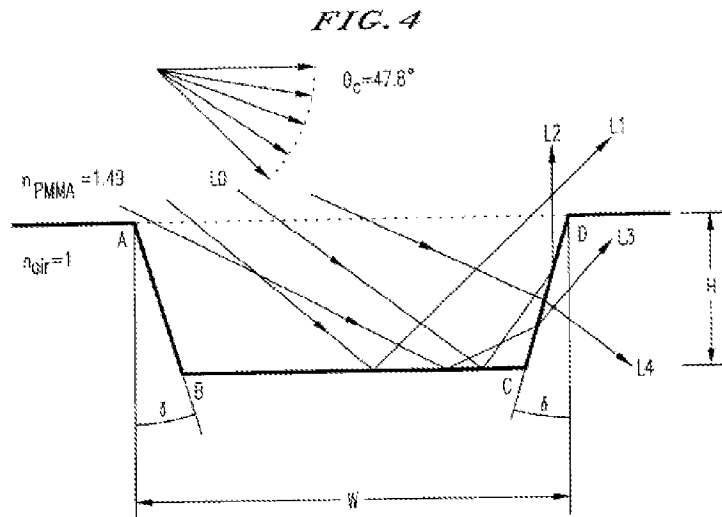


Figure 4 depicts scattering lights L1-L4 on the trapezoidal protruding pattern ABCD of an acrylic waveguide, including pattern width W , pattern height H , and slope angles δ . (Col. 6, ll. 39-55).

10. Shinji discloses examples showing that when the slope angles δ are 0° and 2° , the scattering reflection efficiency is “bad”. (Col. 7, ll. 5-7; Figs. 5 and 6).
11. Shinji discloses that at slope angles less than 3° , the “uniformity ratio of illuminance was bad as its luminance around the light source is low and is high at the end and the average luminance was also low because the scattering reflection performance of unit pattern is low....” (Col. 11, ll. 54-67).
12. Shinji reports the uniformity ratio of illuminance as 72 for slope angles less than 3° . (Table 1).
13. Funamoto's Figure 10 is reproduced below:

FIG.10

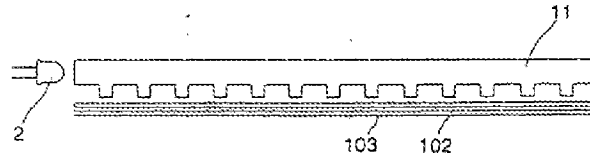


Figure 10 depicts a light source 2, a light guide plate 11, a liquid crystal display panel, and reflecting plate 103. (P. 8, l. 58 – p. 9, l. 5).

14. Funamoto states:

[a] reflecting plate 103 is arranged at the back face of liquid crystal display panel 102, so as to constitute a reflective type liquid display device. Light-guide plate 11 has the function of projecting light rays towards liquid display panel 102 and of transmitting light rays reflected by reflecting plate 103 with scarcely any dispersion.

(P. 8, ll. 55-58).

PRINCIPLES OF LAW

A patent applicant is free to recite features of an apparatus either structurally or functionally. *In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997). Where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on. *Id.* The structure of the prior art apparatus must merely be capable of performing the claimed functional recitation. *Schreiber*, 128 F.3d at 1478-79.

“A reference is no less anticipatory if, after disclosing the invention, the reference then disparages it.” *Celeritas Technologies Ltd. V. Rockwell International Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998).

ANALYSIS

Appellant has grouped certain claims subject to the first ground of rejection separately. However, Appellant relies on the same arguments for each group of claims. Accordingly, we confine our discussion to appealed claim 1 for the first ground of rejection, which contains claim limitations representative of the arguments made by Appellant, and address other claims only to the extent that Appellant has argued them separately pursuant to 37 C.F.R. § 41.37(c)(1)(vii).

Rejection of claims 1-4, 6-9, 11, 14-21, 23, and 24 as being anticipated by Shinji

Appellant’s arguments that Shinji teaches against the recited feature that light reflected along an orthogonal direction to the liquid display device is uniform are not persuasive. Appellant does not challenge that when Shinji’s slope angles equal 0° or 2°, Shinji’s angles are equivalent to the claimed angles being about 90°. (App. Br. 11; *See* FF 2 and 9). Appellant relies on Shinji’s disclosure that at slope angles of 0° or 2°, the scattering reflection efficiency is bad (App. Br. 11, FF 10), and that when the slope angle is less than 3°, the uniformity ratio of illuminance is bad. (Rep. Br. 5, FF 11). However, Appellant’s Specification does not specify the degree of uniformity necessary to constitute “uniform” light as recited in the claims. (FF 6). Thus, we agree with the Examiner that the only difference between Shinji and claim 1, is that the degree of uniformity in Shinji is quantified,

where in claim 1 it is not. (*See* Supplemental Answer entered June 14, 2006, 2 and 3; Supplemental Answer, November 20, 2006, 3). That Shinji disparages the uniformity obtained from lightguides having convex portions with angles equivalent to those claimed does not mean that lightguides disclosed by Shinji are any less anticipatory to the present claims. *See Celeritas, supra*.

Appellant additionally contends that Shinji fails to show incident light directed outwardly along an orthogonal direction after being deflected by the lightguide. (App. Br. 11 and 12). The Examiner contends that because Shinji's lightguide and the claimed light directing member are structurally the same or similar, the uniformity and direction of deflected light are inherent to the structure. (*See* Supplemental Answer entered June 14, 2006, 3; Supplemental Answer entered November 20, 2006, 2; FF 1 and 8). We agree with the Examiner that the orthogonal deflection of incident light is inherent to the shape of the light directing member. Indeed, Appellant's Specification states that by controlling the angles of the convex portions to close to 90°, the more perpendicular the deflected light becomes. (FF 4 and 5). Again, Appellant does not challenge that Shinji's slope angles of 0° or 2° are equivalent to the claimed angles being about 90°. Therefore, Appellant's arguments are not persuasive.⁴

⁴The Examiner provides calculations in order to demonstrate that orthogonal deflection is inherent to incident light entering the convex portions of Shinji's lightguide. (Ans. 10-11, Appendix). Appellant contends that the Examiner's calculations are not correct due to the angles chosen by the Examiner in order to perform the calculation. (App. Br. 11-14; Rep. Br. 5-7, Appendix). Although we agree with Appellant that the angles chosen by the Examiner do not appear consistent with the angles required for the calculation, there is no evidence on the record that the calculation, if

Rejection of claim 10 as being anticipated by Funamoto

Appellant has not provided any persuasive evidence that the arrangement of the reflector in the display panel recited in claim 10 is different than the arrangement of the reflector and the display panel in Funamoto. First, we agree with the Examiner that the claim language “a display panel...including...a reflector” does not impart any particular arrangement between the reflector and the display panel. (Supplemental Answer entered June 14, 2006, 4). Therefore a reflector located outside the substrates may still be considered part of the display panel.

Second, Appellant alleges that Figure 4 discloses the features of claim 10, where the features of the display panel are depicted “immediately above reflector 507.” (Rep. Br. 7). Appellant’s Specification is silent as to the arrangement of the reflector in the display panel. (FF 7). In addition, Figure 4 does not identify any particular structure of the display panel. (FF 1). Thus, Appellant’s statement supports the Examiner’s position that the structure of the display panel and reflector are the same as in Funamoto, where the display panel (102) is immediately above reflector (103). (See FF 13 and 14). Therefore, Appellant has not shown that the recited arrangement of the display panel and reflector in claim 10 is different than the arrangement of the display panel and reflector disclosed in Funamoto.

performed using the correct angles, would contradict the Examiner’s finding that orthogonal deflection of incident light is inherent to Shinji’s lightguide.

CONCLUSION

Appellant has failed to demonstrate that the Examiner erred in finding that Shinji teaches the auxiliary light source device as claimed.

Appellant has failed to show that the Examiner erred in finding that Funamoto discloses the reflective liquid crystal display device as recited in claim 10.

ORDER

We affirm the Examiner's decision rejecting claims 1-4, 6-9, 11, 14-21, 23, and 24 under 35 U.S.C. § 102(e) as being anticipated by Shinji.

We affirm the Examiner's decision rejecting claim 10 under 35 U.S.C. §102(b) as being anticipated by Funamoto.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. §1.136(a)(1)(iv).

AFFIRMED

PL initial:
sld

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